

Claims:

1. A method of making a high impedance surface comprising the steps of:

5 (a) forming a structure from dielectric material, the structure having a plurality of projections on at least one major surface of the structure, the projections having sidewalls;

(b) plating said structure, including said sidewalls, with a layer of metal;

(c) removing at least a portion of the layer of metal which bridges across said projections to thereby define capacitor plates on said sidewalls.

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2. The method of claim 1 wherein the structure is formed with a plurality of holes penetrating the structure therein and wherein the plating step includes plating interiors of the holes.

15 3. The method of claim 1 wherein the structure is made by molding and wherein the dielectric material is a thermoplastic or a thermoset resin.

4. The method of claim 1 wherein trenches are formed in said dielectric material adjacent said ridges.

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5. The method of claim 1 wherein the removing step includes moving at least a portion of at least some of said ridges.

6. The method of claim 1 wherein said ridges define a repeating geometric pattern.

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7. The method of claim 6 wherein the repeating geometric pattern is a pattern of square-shaped cells.

8. The method of claim 1 wherein the removing step adjusts the height of the ridges as a function of location.

9. A method of making a high impedance surface comprising the steps of:

5 (a) forming dielectric material to define a structure of the dielectric material, the structure having a plurality of trenches on at least one major surface of the structure, the trenches having sidewalls and bottom walls; and

(b) plating said structure, including said sidewalls, but not the bottom walls of said trenches, with a layer of metal.

10 10. The method of claim 9 wherein the structure is formed with a plurality of holes therein and wherein the plating step includes plating the interiors of the holes.

11. The method of claim 10 further including the step of inserting a plating inhibiting material  
15 adjacent the bottom walls of said trenches, said step of plating inhibiting material occurring before the plating step is carried out.

12. The method of claim 11 further including the step of removing the plating inhibiting material adjacent the bottoms of said trenches after said sidewalls have been plated.

20 13. The method of claim 10 wherein said trenches define a repeating geometric pattern.

14. The method of claim 13 wherein the repeating geometric pattern is a pattern of square-shaped cells.

25 15. A method of making a high impedance surface comprising the steps of:

(a) forming a structure from a dielectric material, the structure having a first major surface, a second major surface, a plurality of holes which penetrate both major surfaces, and a plurality

of sidewall features on said first major surface; and

(b) applying at least one metal layer to said structure in the interiors of the holes therein, on said sidewall features, and on said second major surface, the at least one metal layer on said sidewall features forming at least portions of plates of capacitors which are connected to neighboring plates of capacitors via the at least one metal layer in said holes and on said second major surface.

16. The method of claim 15 wherein the sidewall features are defined by forming protruding surfaces in said first major surface.

17. The method of claim 15 wherein the sidewall features are defined by forming trenches surfaces in said first major surface.

18. The method of claim 15 wherein the at least one metal layer, when first applied to said structure, covers said structure entirely and thereafter at least one portion of said at least one metal layer is removed to define individual plates of said capacitors.

19. The method of claim 15 wherein the at least one metal layer when first applied to said structure does not cover said structure entirely and is inhibited from covering at least portions of said structure to define thereby individual plates of said capacitors.

20. The method of claim 15 wherein said sidewall features define a repeating geometric pattern.

21. The method of claim 20 wherein the repeating geometric pattern is a pattern of square-shaped cells.

22. The method of claim 15 wherein the structure is a molded structure and the dielectric

material is a thermoplastic or a thermoset resin.

23. A method of making a high impedance surface comprising the steps of:

(a) forming a structure from sheet metal, the structure having a plurality of openings

5 therein with confronting sidewalls on the sides of the openings, the structure also having a plurality of protrusions projecting from a major surface thereof; and

(b) joining said structure to additional sheet metal such that ends of said protrusions remote from said major surface are coupled to the additional sheet metal.

10 24. The method of claim 23 wherein the additional sheet metal is a generally planar sheet metal.

25. The method of claim 23 wherein the protrusions have a greater depth than do the sidewalls.

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26. The method of claim 23 wherein the sidewalls are spaced a distance from the additional sheet metal.

27. The method of claim 23 wherein the sidewalls which confront one another are disposed  
20 parallel to each other.

28. The method of claim 23 wherein said sidewalls define a repeating geometric pattern.

29. The method of claim 28 wherein the repeating geometric pattern is a pattern of square-  
25 shaped cells.

30. A high impedance surface including:

(a) a molded structure having a repeating pattern of sidewall surfaces, the sidewall

surfaces meeting a first major surface of said molded structure; and

(b) a metal layer on said molded structure, the metal layer covering at least a portion of a second major surface of said molded structure to define a ground plane, the metal layer also covering said sidewalls and at least portions of said first major surface.

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31. The high impedance surface of claim 30 wherein the molded structure further includes a repeating pattern of holes therein, the holes penetrating the structure between the first and second major surfaces thereof, and wherein the metal layer is disposed in or fills said holes to thereby interconnect sidewalls with other sidewalls via the metal layer on said second major surface and in said holes.

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32. The high impedance surface of claim 30 further including trenches in said first major surface, the sidewall surfaces joining said first major surface via said trenches.

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33. The high impedance surface of claim 30 wherein said sidewall surfaces have a height which varies across said high impedance surface as a function of location on said high impedance surface.